

To prepare yourself to work safely in the laboratory, read over the following safety rules. Then read them a second time. Make sure you understand and follow each rule. Ask your teacher to explain any rules you do not understand.

Dress Code

1. To protect yourself from injuring your eyes, wear safety goggles whenever you work with chemicals, flames, glassware, or any substance that might get into your eyes. If you wear contact lenses, notify your teacher.
2. Wear an apron or coat whenever you work with corrosive chemicals or substances that can stain.
3. Tie back long hair to keep it away from any chemicals, flames, or equipment.
4. Remove or tie back any article of clothing or jewelry that can hang down and touch chemicals, flames, or equipment. Roll up or secure long sleeves.
5. Never wear open shoes or sandals.

General Precautions

6. Read all directions for an experiment several times before beginning the activity. Carefully follow all written and oral instructions. If you are in doubt about any part of the experiment, ask your teacher for assistance.
7. Never perform activities that are not assigned or authorized by your teacher. Obtain permission before "experimenting" on your own. Never handle any equipment unless you have specific permission.
8. Never perform lab activities without direct supervision.
9. Never eat or drink in the laboratory.
10. Keep work areas clean and tidy at all times. Bring only notebooks and lab manuals or written lab procedures to the work area. All other items, such as purses and backpacks, should be left in a designated area.
11. Do not engage in horseplay.

First Aid

12. Always report all accidents or injuries to your teacher, no matter how minor. Notify your teacher immediately about any fires.
13. Learn what to do in case of specific accidents, such as getting acid in your eyes or

on your skin. (Rinse acids from your body with plenty of water.)

14. Be aware of the location of the first-aid kit, but do not use it unless instructed by your teacher. In case of injury, your teacher should administer first aid. Your teacher may also send you to the school nurse or call a physician.
15. Know the location of the emergency equipment such as fire extinguisher and fire blanket.
16. Know the location of the nearest telephone and whom to contact in an emergency.

Heating and Fire Safety

17. Never use a heat source, such as a candle, burner, or hot plate, without wearing safety goggles.
18. Never heat anything unless instructed to do so. A chemical that is harmless when cool may be dangerous when heated.
19. Keep all combustible materials away from flames. Never use a flame or spark near a combustible chemical.
20. Never reach across a flame.
21. Before using a laboratory burner, make sure you know proper procedures for lighting and adjusting the burner, as demonstrated by your teacher. Do not touch the burner. It may be hot. Never leave a lighted burner unattended. Turn off the burner when not in use.
22. Chemicals can splash or boil out of a heated test tube. When heating a substance in a test tube, make sure that the mouth of the tube is not pointed at you or anyone else.
23. Never heat a liquid in a closed container. The expanding gases produced may shatter the container.
24. Before picking up a container that has been heated, first hold the back of your hand near it. If you can feel heat on the back of your hand, the container is too hot to handle. Use an oven mitt to pick up a container that has been heated.

Using Chemicals Safely

25. Never mix chemicals "for the fun of it." You might produce a dangerous, possibly explosive substance.

SCIENCE SAFETY RULES (continued)

26. Never put your face near the mouth of a container that holds chemicals. Many chemicals are poisonous. Never touch, taste, or smell a chemical unless you are instructed by your teacher to do so.
27. Use only those chemicals needed in the activity. Read and double-check labels on supply bottles before removing any chemicals. Take only as much as you need. Keep all containers closed when chemicals are not being used.
28. Dispose of all chemicals as instructed by your teacher. To avoid contamination, never return chemicals to their original containers. Never pour untreated chemicals or other substances into the sink or trash containers.
29. Be extra careful when working with acids or bases. Pour all chemicals over the sink or a container, not over your work surface.
30. If you are instructed to test for odors, use a wafting motion to direct the odors to your nose. Do not inhale the fumes directly from the container.
31. When mixing an acid and water, always pour the water into the container first then add the acid to the water. Never pour water into an acid.
32. Take extreme care not to spill any material in the laboratory. Wash chemical spills and splashes immediately with plenty of water. Immediately begin rinsing with water any acids that get on your skin or clothing, and notify your teacher of any acid spill at the same time.

Using Glassware Safely

33. Never force glass tubing or a thermometer into a rubber stopper or rubber tubing. Have your teacher insert the glass tubing or thermometer if required for an activity.
34. If you are using a laboratory burner, use a wire screen to protect glassware from any flame. Never heat glassware that is not thoroughly dry on the outside.
35. Keep in mind that hot glassware looks cool. Never pick up glassware without first checking to see if it is hot. Use an oven mitt. See rule 24.
36. Never use broken or chipped glassware. If glassware breaks, notify your teacher and dispose of the glassware in the proper broken-glassware container.

37. Never eat or drink from glassware.
38. Thoroughly clean glassware before putting it away.

Using Sharp Instruments

39. Handle scalpels or other sharp instruments with extreme care. Never cut material toward you; cut away from you.
40. Immediately notify your teacher if you cut your skin when working in the laboratory.

Animal and Plant Safety


41. Never perform experiments that cause pain, discomfort, or harm to animals. This rule applies at home as well as in the classroom.
42. Animals should be handled only if absolutely necessary. Your teacher will instruct you as to how to handle each animal species brought into the classroom.
43. If you know that you are allergic to certain plants, molds, or animals, tell your teacher before doing an activity in which these are used.
44. During field work, protect your skin by wearing long pants, long sleeves, socks, and closed shoes. Know how to recognize the poisonous plants and fungi in your area, as well as plants with thorns, and avoid contact with them. Never eat any part of a plant or fungus.
45. Wash your hands thoroughly after handling animals or a cage containing animals. Wash your hands when you are finished with any activity involving animal parts, plants, or soil.


End-of-Experiment Rules


46. After an experiment has been completed, turn off all burners or hot plates. If you used a gas burner, check that the gas-line valve to the burner is off. Unplug hot plates.
47. Turn off and unplug any other electrical equipment that you used.
48. Clean up your work area and return all equipment to its proper place.
49. Dispose of waste materials as instructed by your teacher.
50. Wash your hands after every experiment.


SAFETY SYMBOLS


These symbols alert you to possible dangers in the laboratory and remind you to work carefully.


 **Safety Goggles** Always wear safety goggles to protect your eyes in any activity involving chemicals, flames or heating, or the possibility of broken glassware.


 **Lab Apron** Wear a laboratory apron to protect your skin and clothing from damage.


 **Breakage** You are working with materials that may be breakable, such as glass containers, glass tubing, thermometers, or funnels. Handle breakable materials with care. Do not touch broken glassware.


 **Heat-Resistant Gloves** Use an oven mitt or other hand protection when handling hot materials. Hot plates, hot glassware, or hot water can cause burns. Do not touch hot objects with your bare hands.


 **Heating** Use a clamp or tongs to pick up hot glassware. Do not touch hot objects with your bare hands.

 **Sharp Object** Pointed-tip scissors, scalpels, knives, needles, pins, or tacks are sharp. They can cut or puncture your skin. Always direct a sharp edge or point away from yourself and others. Use sharp instruments only as instructed.


 **Electric Shock** Avoid the possibility of electric shock. Never use electrical equipment around water, or when the equipment is wet or your hands are wet. Be sure cords are untangled and cannot trip anyone. Disconnect the equipment when it is not in use.


 **Corrosive Chemical** You are working with an acid or another corrosive chemical. Avoid getting it on your skin or clothing, or in your eyes. Do not inhale the vapors. Wash your hands when you are finished with the activity.


 **Poison** Do not let any poisonous chemical come in contact with your skin, and do not inhale its vapors. Wash your hands when you are finished with the activity.


 **Physical Safety** When an experiment involves physical activity, take precautions to avoid injuring yourself or others. Follow


instructions from the teacher. Alert the teacher if there is any reason you should not participate in the activity.


 **Animal Safety** Treat live animals with care to avoid harming the animals or yourself. Working with animal parts or preserved animals also requires caution. Wash your hands when you are finished with the activity.


 **Plant Safety** Handle plants in the laboratory or during field work only as directed by the teacher. If you are allergic to certain plants, tell the teacher before doing an activity in which those plants are used. Avoid touching harmful plants such as poison ivy, poison oak, or poison sumac, or plants with thorns. Wash your hands when you are finished with the activity.


 **Flames** You may be working with flames from a lab burner, candle, or matches. Tie back loose hair and clothing. Follow instructions from the teacher about lighting and extinguishing flames.

 **No Flames** Flammable materials may be present. Make sure there are no flames, sparks, or other exposed heat sources present.

 **Fumes** When poisonous or unpleasant vapors may be involved, work in a ventilated area. Avoid inhaling vapors directly. Only test an odor when directed to do so by the teacher, and use a wafting motion to direct the vapor toward your nose.

 **Disposal** Chemicals and other laboratory materials used in the activity must be disposed of safely. Follow the instructions from the teacher.

 **Hand Washing** Wash your hands thoroughly when finished with the activity. Use antibacterial soap and warm water. Lather both sides of your hands and between your fingers. Rinse well.

 **General Safety Awareness** You may see this symbol when none of the symbols described earlier appears. In this case, follow the specific instructions provided. You may also see this symbol when you are asked to develop your own procedure in a lab. Have the teacher approve your plan before you go further.

LABORATORY SAFETY CONTRACT

I, _____, have read
(please print full name)

the Science Safety Rules and Safety Symbols sections on pages v–vii of this manual, understand their contents completely, and agree to demonstrate compliance with all safety rules and guidelines that have been established in each of the following categories:

(please check)

- ☐ Dress Code
- ☐ General Precautions
- ☐ First Aid
- ☐ Heating and Fire Safety
- ☐ Using Chemicals Safely
- ☐ Using Glassware Safely
- ☐ Using Sharp Instruments
- ☐ Animal and Plant Safety
- ☐ End-of-Experiment Rules

(signature)

Date _____